PREDECISIONAL INFORMATION DISTORTION OF TRIAL EVIDENCE: BIASED PROCESSING UNDER PERSUASION

A Thesis
by
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Abstract

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The distortion of information during decision making has been investigated in a number of contexts. In order to facilitate distortion, these investigations have traditionally not been in persuasive settings nor involved information that strongly favored the selection of one choice over another. A study was conducted that addresses the absence of empirical investigation into how information is distorted during decision processes in persuasive situations. The context of the courtroom was used, as legal proceedings have both persuasive and information processing components. Participants saw numerous pieces of evidence: some of the evidence strongly favored a verdict of guilty; some favored a verdict of not guilty; and other evidence favored neither. Whether participants saw evidence that favored a verdict of guilty or not guilty as the first piece of evidence was manipulated. Some participants were told the evidence came from the prosecution or the defense while others were not. Results indicated that participants distorted information in the direction of the persuasive evidence presented first, regardless of whether or not they were told the source of

the evidence. A general reluctance to render a guilty verdict was also observed as roughly 74% of participants selected a verdict of not guilty. Perhaps because of participants' reluctance to find the defendant guilty, the strong evidence location manipulation did not affect participants' verdict in the case—despite the finding that the manipulation affected evidence evaluation and evidence evaluation was correlated with participants' verdict. Overall, this study demonstrated that information is distorted in predictable ways, even when presented in a persuasive context and when the information strongly favored the selection of one option over the other.

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Dedication

This work is dedicated to my grandfather Art and all of the other great educators who sent me into the world bearing their mark. This is for those who taught me never to stop wondering and who helped me find the courage to go discover.

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Abstract

The distortion of information during decision making has been investigated in a number of contexts. In order to facilitate distortion, these investigations have traditionally not been in persuasive settings nor involved information that strongly favored the selection of one choice over another. A study was conducted that addresses the absence of empirical investigation into how information is distorted during decision processes in persuasive situations. The context of the courtroom was used, as legal proceedings have both persuasive and information processing components. Participants saw numerous pieces of evidence: some of the evidence strongly favored a verdict of guilty; some favored a verdict of not guilty; and other evidence favored neither. Evidence that favored a verdict of guilty or not guilty as the first piece of evidence was manipulated. Some participants were told the evidence came from the prosecution or the defense while others were not. Results indicated that participants distorted information in the direction of the persuasive evidence presented first, regardless of whether or not they were told the source of the evidence. A general reluctance to render a guilty verdict was also observed as roughly 74% of participants selected a verdict of not guilty. The strong evidence location manipulation did not affect participants' verdict in the case—despite the finding that the manipulation affected evidence evaluation and evidence evaluation was correlated with participants' verdict. Overall, this study demonstrated that information is distorted in predictable ways, even when presented in a persuasive context and when the information strongly favored the selection of one option over the other.

Predecisional Information Distortion of Trial Evidence:

Biased Processing Under Persuasion

Often in life we are presented with situations in which we must decide among a number of possible alternatives. These decisions often are presented to us by a party with some vested interest (e.g., a sales clerk, a lobbyist, a representative of a software company). This is especially true in situations where objectivity and truthfulness are inherent and upheld values of the setting. One such venue to which this applies is that of the courtroom. A fair trial by jury comes with the goal that, among other things, jurors evaluate evidence in an unbiased and probative manor (Carlson & Russo, 2001; Kerstholt & Jackson, 1998; Lawson, 1968; Pennington & Hastie, 1992; Simon, 2004). In order to do so, a general forfeiture of previous bias and subjectivity in decision makers is encouraged by juror instruction (Simon, 2004). As legal decisions should derive naturally from prescriptive forms of logic (Simon, 2004), an expectation of rational decision-making is present for the rulings of deciding bodies in the court. While the settling of disputes in an unbiased and rational fashion is the primary function of the court, this must be accomplished while also incorporating the arguments and evidence from two opposing sides. Furthermore, each side is differentially motivated to present their argument in a way that favors their respective case.

The goal of jurors or judges in the court is to come to an objective decision. As a growing body of research suggests, people will attempt to resist actively targeted persuasive arguments, such as those presented in the court, by bolstering their previously held beliefs (Wood & Quinn, 2003). The task of jurors comes with it a twofold responsibility: jurors must interpret persuasive information in an unbiased manner and then use this information to make a decision without subjectivity. Considering this, a conundrum exists for jurors in that

an objective decision must be made from subjective and persuasive information. As a result, these decisions may not represent the least biased interpretation of events submitted in legal proceedings.

A great deal of research has been conducted describing the manner in which jurors make decisions (e.g., Carlson & Russo, 2001; Holyoak & Simon, 1999; Kerstholt & Jackson, 1998; Lawson, 1968; Pennington & Hastie, 1992; Simon, 2004). Some of this research has examined the processes involved in jurors' interpretation of evidence in legal proceedings and whether these interpretations are biased in systematic and predictable ways (Carlson & Russo, 2001; Holyoak & Simon, 1992; Kerstholt & Jackson, 1997; Pennington & Hastie, 1992; Simon, 2004). However, there is a limited amount of research describing how people interpret information when they are targets of persuasive attempts (for review see Benoit, 1998; Eagley & Chaiken, 1993; Petty & Wegner, 1998; Wood & Quinn, 2003). Therefore, I investigated how participants interpret persuasive information in the context of a court case in which evidence is presented from the inherently persuasive and opposing positions of the prosecution and defense. I predicted that, in line with previous research, participants would perceive information in a biased manner, despite being aware they were targets of persuasive attempts and having the goal of making an unbiased decision.

The Story Model of Juror Decision Making

One dominant explanatory theory of juror decision making is known as the Story Model (Pennington & Hastie, 1992). This model suggests that when evaluating evidence, jurors apply a narrative story to the evidence in order to make sense of the events. Central to the formation of this story is the consideration of the relationship between purposeful and causal events. This story then plays a guiding role in the selection of a final verdict

(Pennington & Hastie, 1992). Some of the inferences involved in the construction of the story may be attributable to the presentations by the prosecution or the defense, while others may be attributable only to the juror (Pennington & Hastie, 1992).

While jurors may construct and consider multiple stories, the one that satisfies certain qualities of coherence will dominate the others. Pennington and Hastie (1992) define coherence of a story as consisting of three separate parts. The first, consistency, is the degree to which the pieces of information in the story do not logically conflict or contain internal disagreements. The second is completeness, the degree to which all the parts of the story are present. And the third, plausibility, is the degree to which the events of the story agree with or contradict real or imagined events in the world. The story created by the juror in the process of making sense of evidence that most embodies these three attributes will be represented as the most coherent sequence of events. If this story in the juror's mind suggests guilt or innocence, the juror will then render that verdict.

Pennington and Hastie (1992) note that many of the elements of the story that a juror might construct will consist of true events presented during the trial. However, the story will also be influenced by inferences made by the jurors while they are evaluating the evidence. The story model of juror decision making provides a conceptual framework for how jurors interpret and order information, but it does not specifically elaborate upon ways in which information is transformed as a part of the understanding process. Furthermore, it does not elaborate upon the underlying mechanisms involved in the interpretation and processing of information. The story model merely describes that jurors attempt to organize the information they receive during a trial to create a coherent story. In order to create a more

complete understanding of the ways in which information is processed when making a decision, we must understand the evaluation processes that occur during decision-making.

Cognitive Consistency and Coherence Models of Decision-Making

Another line of research that describes the way information is perceived and transformed in order to make a decision is that of Cognitive Coherence theories. These theories posit that information involved in complex decisions becomes unconsciously transformed in order to support a coherent, consistent emerging argument or decision. This occurs as a part of the perception and deliberation process, so that a once difficult choice between two similar alternatives has been changed to represent a choice between a now strong leading alternative and weaker opposing alternative (Gräns, 2010; Holyoak & Simon, 1999; Simon, 2004; Thagard & Verbeurgt, 1998).

The changes in the perception of information are the result of two things: Coherence in the decision process and the constraints on the decision (Holyoak & Simon, 1999; Simon, 2004). Regarding the latter, Holyoak and Simon (1999; see also Simon, 2004; Thagard & Verbeurgt, 1998) suggest that when people make a decision, they are aware that a certain constraint or constraints must be satisfied for the decision to be considered complete. That is various decisions have different final options available, and in order to make a decision, one must select from the available options (Thagard & Verbeurgt, 1998). The process of making a decision according to its constraints, or following the rules of the decision, is known as constraint satisfaction. For example when deciding between restaurants for a meal, the selection of a hardware store would not complete the decision. The decision is constrained in that final selection must be from the category "restaurants," and a successful decision has not been made until a selection (a restaurant) that satisfies the decisional constraint is selected.

According to Holyoak and Simon (1999), the goal of making a decision that does not violate the rules of that decision domain is one antecedent to the cognitive restructuring that occurs during the deciding process.

A second antecedent is the principle of coherence. Research suggests that when evaluating information, people will categorize the pieces according to how easily they fit together (cohere) conceptually (Simon, 2004; Thagard & Verbeurgt, 1998). As information is represented in the mind, it may cohere or incohere with other pieces of information according to concepts such as induction, deduction, explanation, compatibility, incompatibility, association, disassociation, etc. (Thagard & Verbeurgt, 1998). For example, the assertion that Patrick went to the store to return some videotapes at 4:00 P.M. and that Patrick was at the scene of a crime at 4:00 P.M. incohere in that they do not agree logically. In order to enhance the coherence of information, people might change their interpretations of said information (Simon, 2004).

In short, coherence-based models suggest that the goal of satisfying constraints drives the evaluation of information so that it is restructured according to the principle of coherence. The restructuring of the mental representations of information during the decision process is known as a coherence shift (Simon, 2004). As a result of these coherence shifts, the information about the problem will gradually be restructured to support an emerging decision until a formerly complex and challenging decision is transformed so that a choice may be rendered more easily and with more confidence (Holyoak & Simon, 1999; Simon, 2004).

While coherence shifts have been empirically observed in numerous contexts, the specific nature and extent of such shift remains unelaborated. Cognitive consistency models improved upon the Story Model of juror decision making in that they specify that

information will be restructured to form a coherent story. However, what is missing from this understanding is the exact way and the extent to which the mental representation of the information is changed in the mind due to these coherence shifts. Another body of literature rooted in the evaluation of product information has succeeded in developing a paradigm capable of articulating moment-by-moment changes in interpretations of information during a decision. This body of literature refers to these shifts in coherence during the decision process as predecisional information distortion and allows shifts in the perception of information towards coherence with a decision to be observed.

Predecisional Information Distortion

Research into predecisional information distortion shares many similarities with cognitive coherence and consistency literature. Both strive to explain changes in the mental representation of information in a decision task. However, the information distortion literature differs in the specificity it provides on the magnitude and direction of the distortion of each individual piece of information in the decision process.

Information distortion is often measured using the Stepwise Evolution of Preference (SEP) method (Meloy & Russo, 2004; Russo et al., 2008). While the entire SEP method is not necessary to measure the distortion of information during decisions, pieces of it are used in nearly every study of information distortion (e.g., Carlson, Meloy & Russo, 2006; Carlson & Russo, 2001; Meloy & Russo, 2004; Russo, Carlson, & Meloy, 2006). The SEP method consists of two crucial components. The first component is that each piece of information about a possible choice is presented one at a time. The second component is that after the presentation of each piece of information, three questions are asked. First, the decision maker is asked to report his or her evaluation of the information to the extent that it favors

one decision or another. In a decision between two alternatives, such as a jury trial where a decision between guilty and not guilty must be rendered, participants might respond using a scale anchored on each end by the extent to which the information favored the selection of guilty or not guilty. Second, a question is asked that is designed to evaluate the current leader in the selection process of available options. For example, a decision maker might be asked if he or she is leaning towards a verdict of guilty or not guilty. Finally, the decision maker indicates his or her confidence that the currently leading choice will ultimately be the one selected after all information has been viewed.

To illustrate the SEP method, imagine that a decision maker must decide between two different cars. The decision maker would be given numerous pieces of information about the cars. For example, he might be told that Car A has 300 horsepower and gets 19 miles per gallon while Car B has 280 horsepower and gets 23 miles per gallon. The decision maker would then indicate the extent to which this information favored the selection of Car A or Car B. The decision maker would then indicate which of the cars he was leaning towards selecting as his final choice. Next, the decision maker would indicate his confidence that his current leader would end up being the one ultimately selected after all the information about the two cars has been viewed. This process would be repeated for each new piece of information concerning the two models of cars. Finally, the decision maker would render a decision by choosing one of the car models and then indicate his confidence that he made the "correct" selection (Meloy & Russo, 2004).

The SEP method allows for a step-by-step consideration of information during the process of making a decision. As described earlier, Cognitive Coherence theories predict that as an initial leader comes to dominate a decision process, a decision maker's mental

representation of information will change to cohere with this initial leaning. Because the SEP method takes measures at each information presentation, it allows for a quantification of this process. Further support for the relevance of Cognitive Coherence models of decision-making as they relate to Information Distortion comes from an explanation proposed and tested by Russo et al. (2008). With the use of a subliminal priming technique, Russo and colleagues demonstrated that the goal of consistency during the decision process led to predictable distortions of information. Russo et al. (2008) concluded that consistency is a causal driving force behind the distortion of information. This finding parallels that of Cognitive Coherence models of decision making that suggest that coherence (sometimes referred to as consistency) drives the shift in interpretation of information (Simon, 2004).

Using some form of the SEP method, information distortion has been observed in a number of contexts. Studies have demonstrated the distortion of information when deciding between brands of products (Russo, Meloy, & Medvec, 1998), between restaurants and hotels (Russo et al., 1996), when evaluating a single option with no alternatives (Bond et al., 2007), when making a decision on behalf of another (Polman, 2010), when evaluating risky choices and probabilities (DeKay, Patino-Echeverri, & Fishbeck, 2009; DeKay, Stone, & Miller, 2011; DeKay, Stone, & Sorenson, 2011), and in mock jurors' interpretations of pieces of evidence (Carlson & Russo, 2001).

Many information distortion studies evaluate how the biased interpretation of information can arise during the decision process. However, it has also been demonstrated that this process can be manipulated with the purpose of altering the outcome of a decision. For example, Carlson et al. (2006) showed that by manipulating the sequence of the presentation of various attributes so as to establish an early preference for one choice over

another, it was possible to affect which product a consumer would ultimately choose. In one of their studies, they had people make a choice between two similarly attractive backpacks. All of the participants evaluated the same information regarding both backpacks, but they evaluated the information in one of two orders. In one order, favorable information concerning one backpack was presented in the first position while information favoring the other backpack was presented in the fourth position (of six). All other pieces of information in the sequence were neutral concerning which brand they favored. It was observed that not only did the placement of favorable information about one brand lead to its selection at significantly above chance levels but that the perception of the opposing piece of information in the fourth position was distorted to appear more favorable to the initial targeted brand.

Russo et al. (2006) also showed that by using a similar type of attribute order manipulation, it was possible to increase significantly the number of persons who chose an objectively inferior alternative compared to its superior counterpart. These findings are compelling in that the inferiority of the alternative was dictated by each participant in a previous evaluation of individual preferences. The manipulation was then implemented so that participants selected a product they previously evaluated as inferior in comparison to its alternative. The selection of an inferior alternative is of particular interest in this context considering the relative neutral value of the information typically used in information distortion studies and the SEP method. That decision makers could be manipulated into interpreting neutral information as being supportive of one decision or another is of concern.

The studies described above concern relatively innocuous situations of biased interpretations of information. A context in which information distortion might have more dire consequences is that of the legal world. Carlson and Russo (2001) identified

information distortion in mock jurors. This highlights a particularly troubling situation in which individuals involved in legal proceedings, situations founded upon rational unbiased decision making, showed biased information processing of trial evidence (Carlson & Russo, 2001; see also, Lawson, 1968; Simon, 2004). To assess this, Carlson and Russo (2001) used a modified version of the SEP method in the context of both a civil and a criminal court case. Participants were given instructions to interpret the information presented to them as they would in real court proceedings, basic background information, and then evaluated the information of civil and criminal proceedings. Two different samples underwent the same procedure. One sample was made up of undergraduate students while the other was made up of individuals selected for jury duty who had just undergone juror orientation. Not only was the distortion of trial evidence observed, those selected for jury duty distorted information at nearly twice the magnitude of the student mock jurors (Carlson & Russo, 2001).

While information distortion has been observed in legal contexts, Carlson and Russo's (2001) investigation of this phenomenon is limited. Specifically, the information presented to potential jurors was ambiguous in nature—that is, none of the information clearly supported the prosecution or defense. Not only is this unrealistic in court proceedings, but it may have served to exaggerate the amount of distortion observed in this study. Furthermore, in a trial setting, evidence is presented by parties who have motivation to sway the jurors, and as Wood and Quinn (2003) commented, people may resist persuasion attempts when they are aware that they are the targets of those attempts—a factor that may deflate the overall distortion of the perception of trial evidence. Additionally, the manner in which strong pieces of evidence may influence the distortion of subsequent information in this context is a matter unaddressed. An application of a step-by-step method observing the

decisional process in a persuasive context with non-neutral information is absent from literature concerning decisional processes.

Current Study

The goal of the present study was to assess the extent to which information distortion will be observed in the evaluation of legal evidence as presented by parties motivated to supply persuasive information (the prosecution and defense) and to examine if this information distortion will affect final verdict selection. This was accomplished by manipulating the order of evidence, as well as participants' knowledge of the source of the evidence (i.e., while all participants saw the same evidence, some were aware of the source of the information while others were not).

Six pieces of evidence were presented to participants. One of these pieces strongly favored the prosecution (i.e., a verdict of guilty) while another strongly favored the defense (i.e., a verdict of not guilty). The remaining four pieces were neutral in that they did not support either the prosecution or defense. Participants evaluated the extent to which they felt each piece of evidence favored a verdict of guilty or not guilty, indicated their current leaning in their decision process as well as their confidence that their current leaning would be their final decision. This process was repeated for each piece of evidence until all had been evaluated. The participants then rendered their final verdict decision regarding guilty or not guilty.

In order to install an initial leader in the decision process the pieces of evidence that strongly favored the prosecution and the defense were always placed as the first and last pieces participants evaluated, separated by the four neutral pieces. Half of the participants were randomly assigned to see the prosecution-favoring evidence first (and the defense-

favoring last) while the other half saw the reverse order. Similarly, in order to assess the effects of the participant being aware they were the target of a persuasive attempt, half of the participants were randomly assigned to see information indicating that the first three pieces of evidence they evaluated were from the source with the corresponding argument (source information regarding the prosecution always accompanied the strong prosecution piece of evidence). The source and corresponding evidence order were never mismatched.

I hypothesized that participants would distort information to be consistent with the first piece of evidence they received. For example, if a person is presented with persuasive evidence from the defense first, he or she will perceive later evidence from either party as being more supportive of the defense's case. Furthermore, I hypothesized that after installing an initial leader, an equally persuasive yet opposing argument presented at the end of the sequence would be perceived in a distorted manner.

Method

Participants

The IRB board approved research with human participants on 4/8/2013, see Appendix A for approval documents. Using Amazon's Mechanical Turk service 301 (46.7% female, 0.3% did not respond, M_{age} = 39.82 years, SD_{age} = 14.26 years) were recruited. They were compensated $0.50 each for their participation.

Design

The general research design was a 2 (Strong Evidence Location: defense first vs. prosecution first) x 2 (Source Information: present vs. absent) x 6 (Evidence Position) mixed factorial design with Strong Evidence Location and Source Information being between subjects factors and Evidence Position being a within subjects factor.

Materials

Evidence selection and diagnosticity of the evidence. The pieces of evidence used in the experimental procedure were selected from a larger pool of items. In order to identify evidence that was relatively neutral, favored the defense, and favored the prosecution, a sample of 12 pieces of evidence was created and pilot tested. One hundred thirteen students at Appalachian State University, for partial fulfillment of undergraduate research requirements, reviewed the evidence (see Appendix A for IRB documentation). Four sets of three pieces of evidence were created from the original 12 and participants were randomly assigned to see one of the four evidence sets (i.e., each participant evaluated three pieces of evidence). In order to avoid distortion during the evidence evaluation process, for any given participant, each piece of evidence was presented with a different case background and circumstance, and the pieces of evidence were presented in a random order. The participants evaluated each piece of information on the extent to which it favored a verdict of guilty or not guilty on a scale from 1 (strongly suggests not guilty) to 9 (strongly suggests guilty). Based on the results of the pilot study, six pieces were selected, four for their neutral indication and two for their favor of the prosecution and defense respectively (see Appendix B).

In order to assess information distortion during a decision process, it was important that ratings of the evidence were secured when participants were not in the act of considering pieces for a final decision. This way, the ratings of the pieces of evidence given individually indicate the objective extent to which each piece favors a final verdict of guilty or not guilty. This is termed diagnosticity. Deviation from these objective values observed during a decision process can be considered biased as a result of the process. To provide these

objective comparison evaluations, the six pieces selected were assessed by a sample drawn from the same population as the experimental group—these participants constituted our control condition. One-hundred six individuals (M_{age} = 34.96 years, SD_{age} = 9.33 years, 49% female) were recruited using Amazon's Mechanical Turk and were compensated $.50 for their participation (see Appendix A for IRB documentation). Each participant saw the six pieces of evidence in a random order, each presented with a different background, accused crime, and named individual (so as to avoid distortion polluting evaluation of the pieces of evidence, see Russo et al., 1996 for a similar procedure for obtaining unbiased evaluations). Similar to the evidence selection sample, participants in this control condition indicated on the same one to nine scale described above the extent to which they felt the evidence favored a final verdict of guilty or not guilty. The average of the rating per question were used as objective indicators of the diagnosticity of each item (see Appendix B for these means).

Individual difference measures. In order to assess the effects a participant's attitude towards the justice system could have on their evaluation of the evidence, the Juror Bias Scale, JBS, (Kassin & Wrightsman, 1983) was administered after the evidence was evaluated. The JBS assesses pre-existing attitudes participants had concerning the legal process and proceedings therein. This scale asks participants to indicate how much they agree with prosecution (e.g. "A suspect who runs from the police most probably committed the crime.") and defense-endorsing statements (e.g. "The death penalty is cruel and inhumane.").

Additionally the need for cognition scale, NFC, (Cacioppo, Petty, & Kao, 1984) was used in order to gain a measurement of the participants' preference for effortful cognition. This scale asks participants to indicate how much they agree with statements that favor effortful thought when problem solving (e.g. "I really enjoy a task that involves coming up

with new solutions to problems") or the rejection of effortful thought (e.g. "Learning new ways to think doesn't excite me very much").

Procedure

Before beginning the study participants viewed an informed consent document (see Appendix C). After selecting that they agreed to participate, they were shown a statement designed to evaluate if they were reading the information presented them. To evaluate if participants were attending to directions, they were shown a passage which discussed the importance of following instructions, (see Appendix D). Below this passage was a fill in the blank question asking "What is your favorite sport?" Within the passage were explicit instructions to ignore the sports questions and instead to type "I have read these instructions." The response to this item was used as a way to evaluate the attentiveness of the participant (Oppenheimer, Meyvis, & Davidenko, 2009).

After the attention check, participants were given instructions that they were to act as jurors evaluating evidence in a criminal trial assessing the guilt or innocence of a hypothetical scenario in which a gentleman, Mr. S, is accused of embezzlement from the computer components manufacturing company for which he works. After reading instructions and background information (see Appendix E), the participants were presented with six pieces of evidence (see Appendix B for a list of the pieces of evidence). The first and last pieces of evidence had persuasive valence for opposing sides. Half of the participants saw the pieces of evidence in the order of 1 through 6 (i.e., they saw the piece that strongly favored the defense first and the piece that strongly favored the prosecution last). The other half of the participants saw the pieces of evidence in the opposite order (i.e., they saw the piece that strongly favored the prosecution first and the piece that strongly favored

the defense last). Participants in the source information present condition were told that pieces of evidence 1-3 came from the defense and pieces 4-6 came from the prosecution. Participants in the source information absent condition saw the same pieces of evidence and presentation order, but were not told which side provided each piece of evidence and were therefore unaware of the source of the evidence.

Following the presentation of each piece of evidence, participants were asked to assess the extent to which they felt the evidence favored a verdict of guilty or not guilty (1 = Favors Not Guilty, 9 = Favors Guilty), whether they currently were leaning towards a verdict of guilty or not guilty (binary choice of guilty or not guilty), and how confident they were that their current verdict will also be their final verdict (1 = Not at all confident, 9 = Very confident) (see Appendix F for the exact measures). After all pieces of evidence were evaluated, the participants rendered a final verdict followed by a final measure of confidence that their final verdict was the correct decision (1 = Not Confident, 9 = Very confident). The participants then filled out NFC (Cacioppo et al., 1984), the JBS (Kassin & Wrightsman, 1983), and indicated their age, education level, and gender. Following the administration of these questions, the participants were debriefed, thanked, and compensated for their participation.

Results

Evidence Evaluation

For all analyses reported, I excluded 36 participants (12% of the sample) who failed the attention check (conclusions made from analyses did not differ depending upon the exclusion of these participants). In order to address my primary hypothesis that participants would distort their evaluation of the pieces of evidence in the direction of the initial

persuasive information, it was first necessary to evaluate the differences in the experimental group's evaluation of the evidence compared to the unbiased control group. To do this, a difference score was calculated for each piece of evidence the participants evaluated. This difference score was obtained by subtracting the average value observed for a specific piece of evidence in the control group from the score each participant in the experimental group gave regarding whether the evidence favored a verdict of guilty or not guilty. The resulting difference score indicates whether the participant evaluated the evidence to be more indicative of a guilty verdict (positive numbers) or a not guilty verdict (negative numbers) relative to the control group. These difference scores were then analyzed in a 2 (Strong Evidence Location: defense first vs. prosecution first) X 2 (Source Information: present vs. absent) X 5 (Evidence Position) analysis of variance (ANOVA) where Strong Evidence Location and Source Information were between subjects factors and Evidence Position was a within subject factor. While participants evaluated six pieces of evidence in total, only pieces seen in positions two through six were analyzed. As the evaluation of the first piece of evidence is considered to be unbiased because participants are evaluating this piece in isolation and have not yet had an opportunity to distort the information. Omission of the first evaluation of the sequence from the analysis is consistent with previous research (e.g., see Russo et al., 1996).

Mauchly's test indicated the assumption of sphericity had been violated, $\chi^2(9) = 60.90$, $p < .001$, therefore Greenhouse-Geisser corrected degrees of freedom are reported. As hypothesized, the ANOVA revealed a main effect of Strong Evidence Location, $F(1, 261) = 19.60$, $p < .001$, $\eta_p^2 = .070$. Consistent with the hypothesis that distortion would differ as a function of the order of the strong evidence location, this analyses indicated that, on average,

distortion values favored the prosecution more strongly when participants saw evidence from the prosecution first as compared to the defense first.

A main effect of Evidence Position was also observed, indicating that the difference scores of the five pieces of evidence varied within participants, $F(3.54, 922.79) = 3.29$, $p = .014$, $\eta_p^2 = .012$. A Strong Evidence Location X Evidence Position interaction, $F(3.54, 922.79) = 14.78$, $p < .001$, $\eta_p^2 = .034$, was also found. As shown in Figure 1, when participants saw evidence from the prosecution presented first, they tended to distort information increasingly in the direction of the prosecution. When participants saw evidence favoring the defense first they distorted the information back and forth toward the defense and prosecution, alternating as they assessed the evidence. Post hoc pairwise comparisons indicated that difference scores differed between the two Strong Evidence Location conditions for evidence presented at positions two ($p < .001$), four ($p = .003$), and six ($p < .001$), but not at positions three ($p = .815$) and five ($p = .502$).

Additionally, a marginally significant and unexpected interaction between Evidence Position and Source Information was observed, $F(3.53, 922.79) = 2.43$, $p = .054$, $\eta_p^2 = .009$. This interaction shows that participants evaluated pieces of evidence differently as a function of source information. As shown in Figure 2, participants distorted information increasingly toward the prosecution when they are not aware of the source of the information. When informed of the evidence source, participants distorted most information in favor of the prosecution with the exception of fourth piece they saw. This pattern suggests that when participants were not aware of the source of evidence presented, they tended to evaluate information as supportive of the prosecution. When they were aware of the source information, they also tended to evaluate information as favoring the prosecution no matter

the order in which they saw the evidence. However when the opposing source introduces information the first piece evaluated exhibits distortion towards the defense.

No main effect of Source Information, $F(1, 261) = .02$, $p = .888$, $\eta_p^2 = .000$, Strong Evidence Location X Source Information interaction, $F(1, 261) = 1.30$, $p = .256$, $\eta_p^2 = .005$, or Evidence Position X Strong Evidence Location X Source Information interaction, $F(3.54, 922.79) = 1.79$, $p = .137$, $\eta_p^2 = .007$, was observed.

Confidence

In addition to analyzing how participants evaluated the evidence, I also examined participants' confidence that their current verdict after evaluating each piece of evidence would also be their final verdict. Participants' confidence that their current verdict would also be their final verdict was analyzed in a 2 (Strong Evidence Location) X 2 (Source Information) X 6 (Evidence Position) ANOVA with Strong Evidence Location and Source Information as between-subjects factors and Evidence Position as a within-subject factor. Mauchly's test indicated the assumption of sphericity had been violated, $\chi^2(14) = .371.55$, $p < .001$, therefore all tests are reported using Greenhouse-Geisser corrected degrees of freedom.

Tests of within subjects effects showed a main effect of Evidence Position, indicating that average confidence changed between pieces of evidence as they were evaluated, $F(2.99, 781.34) = 6.62$, $p < .001$, $\eta_p^2 = .025$. Within-subjects contrasts indicated a linear pattern described the change in confidence as information was evaluated, $F(1, 261) = 11.67$, $p = .001$, $\eta_p^2 = .043$ (a quadratic pattern also described this effect but is presented as a secondary model). The quadratic model was associated with a higher probability value and substantially smaller effect size, $F(1, 261) = 5.19$, $p = .024$, $\eta_p^2 = .019$. As shown in Figure 3,

overall, participants became more confident that their current verdict would also be their final verdict as they evaluated more evidence.

No main effect of Strong Evidence Location was observed, $F(1, 261) = 0.70$, $p = .403$, $\eta_p^2 = .003$. Participants' confidence did not change as a function of seeing strong evidence from the prosecution or defense first. An interaction between Evidence Position and Strong Evidence Location was observed, $F(2.99, 781.34) = 5.02$, $p = .002$, $\eta_p^2 = .019$. As shown in Figure 3, if participants saw the evidence favoring the prosecution first, confidence tended to increase as the participant evaluated evidence. However, confidence did not change systematically when participants saw evidence favoring the defense first.

A marginally significant main effect of Source Information was present, $F(1,261) = 3.57$, $p = .060$, $\eta_p^2 = .013$. Participants who were given source information regarding the evidence were slightly more confident in their current verdicts than those without source information (see Figure 4). Tests of remaining two way interactions, Source Information X Strong Evidence Location, $F(1,261) = 0.49$, $p = .483$, $\eta_p^2 = .002$, Current Verdict Confidence X Source Information, $F(2.99, 781.34) = 0.89$, $p = .445$, $\eta_p^2 = .003$, and three way interaction, Current Verdict Confidence X Source Information X Strong Evidence Location, $F(2.99,781.34) = 0.63$, $p = .597$, $\eta_p^2 = .002$, were not significant.

Distortion and Confidence

Of additional interest was the relationship between participants' confidence that their current verdict will be their final verdict and the amount of distortion they exhibit during the decision process. To investigate this, confidence ratings across all pieces of evidence were averaged for each participant. The difference scores taken by subtracting participants' evaluations of each piece of evidence from the neutral control groups' evaluations were

converted into absolute vales so that higher values would represent more distortion, irrespective of whether they favored a verdict of guilty or not guilty. The absolute values were then averaged across pieces of evidence per participant. Average confidence and average distortion were then correlated. This analysis revealed a moderate correlation between distortion and confidence, $r(263) = .38$, $p < .001$. This analysis indicates that increased levels of distortion were associated with increased confidence.

Beyond examining if confidence was related to distortion in general, I also investigated if the absolute value of distortion at any point in the decision process predicted confidence at that same point in the process. In order to properly model the possibly changing relationship between distortion and confidence as a function of point in time in the sequence of evidence evaluations a multilevel regression approach was employed. Evidence position was treated as a fixed variable and the absolute value of distortion was treated as a random variable with unstructured covariance. Tests of the fixed effect of evidence position indicated the absolute value of distortion predicted confidence when accounting for evidence position within and across participants, $\beta = 0.07$, $t(1302.78) = 4.81$, $p < .001$. Estimates of covariance parameters for the random variable absolute value of distortion revealed that intercepts for the relationship between distortion and confidence varied across evidence position, $\beta = 3.05$, $SE = 0.31$, $p < .001$. Covariance between intercepts and slopes for the relationship between absolute value of distortion and confidence was also significant, $\beta = 0.18$, $SE = 0.06$, $p = .004$. Variance of the slopes was not significant, $\beta = 0.01$, $SE = 0.02$, $p = .623$. Taken together, these findings indicate that the relationship between absolute value of distortion and confidence changes as a function of the intercept. Similarly, the relationship also varied significantly depending on evidence position. As the betas for tests

of the random variable absolute value of distortion are all positive, this can then be interpreted as participants becoming more confident as a function of progressing evidence position and that the relationship between distortion and confidence increased as confidence increased.

Verdict

Across all experimental conditions, 68 participants, (25.7% of the sample) rendered a guilty verdict. This, of course, means that a vast majority (197 individuals or 74.3%) of the experimental sample rendered a final verdict of not guilty. Binary logistic regression was used to test if level of Source Information, Strong Evidence Location, or the Source Information X Strong Evidence Location interaction predicted final verdict. This analysis indicated that experimental group membership did not predict final verdict, $\chi^2(3) = 1.88$, $p = .597$, (Strong Evidence Location, $\beta = 0.12$, $p = .763$; Source Information, $\beta = 0.36$, $p = .355$; Source Information X Strong Evidence Location interaction, $\beta = -0.648$, $p = .256$). While Strong Evidence Location did affect evidence evaluation as show in the earlier analyses, it did not influence final verdict selection.

This outcome was unexpected and raises the possibility that participants' evidence evaluation was not related to their final verdict. To test this, evidence evaluation was averaged across evidence per participant. Average evidence evaluation was then regressed on final verdict. The binary logistic regression revealed that average evidence evaluation predicted final verdict, $\chi^2(1) = 59.95$, $p < .001$, $\beta = 1.62$. The model explained 29.8% (Nagelkerke R^2) of the variance in final verdict and correctly classified 78.5% of final verdicts. Increased average evidence evaluations (evaluations that on average were evaluated

as supporting a guilty verdict) were associated with increased likelihood of rendering a guilty verdict.

As evidence evaluations significantly predicted final verdict selection I was also interested in whether the distortion of the evidence would predict final verdict. The average of the absolute value of evidence difference scores (absolute value of distortion) was regressed on final verdict using binary logistic regression. This regression revealed that the absolute value of distortion predicted final verdict decision, $\chi^2(1) = 40.29$, $p < .001$, $\beta = 1.63$. The model explained 20.7% (Nagelkerke R^2) of the variance in final verdicts and correctly classified 76.6% of all final verdicts. As the absolute value of distortion increased, so did the likelihood that a participant would render a final verdict of guilty. Participants who exhibited more evidence distortion were more likely to render a final verdict of guilty.

Participant Characteristics and Exploratory Analyses

In addition to experimental variables of interest, a number of other individual difference measures and participant characteristic relationships were explored (see Table 1 for correlations). As a reminder, the JBS was used to assess preexisting attitudes participants may have had about the legal system by measuring their agreement with various prosecution and defense supporting statements. The NFC was also employed to assess the amount that each participant enjoyed effortful thought and problem solving. The JBS was negatively correlated with final verdict (lower JBS scores indicate prosecution favoring bias and final verdict was coded with 0 representing not guilty and 1 representing guilty). Participants who displayed a prosecution bias tended to render a final verdict of guilty. The JBS did not predict final verdict confidence. The JBS was also negatively related to the average absolute value of distortion and average current verdict confidence. As scores on the JBS increased

(defense favoring), the average absolute value of distortion and current verdict confidence decreased.

As for Need for Cognition, NFC did not predict either final verdict or final verdict confidence. There was, however, a significant positive relationship between the JBS and NFC. Higher scores on the JBS (defense favoring) were associated with higher NFC (desiring more effortful thought and problem solving). NFC was also negatively correlated with average current verdict confidence. Higher current verdict confidence scores were associated with lower need for cognition scores. Average current verdict confidence was positively correlated with final verdict confidence and final verdict. Participants who were more confident in their current verdicts on average tended to be more confident in their final verdict as well.

Beyond experimental outcome relationships, other variables were also evaluated, and some findings of interest are reported. Participant age and the absolute value of distortion were negatively correlated; older individuals exhibited smaller magnitudes of distortion. Participant age was negatively related to evidence evaluation scores; older individuals tended to evaluate the information as more indicative of not guilty. Age was also negatively related to final verdict with older participants tending to render final verdicts of not guilty.

Level of education was correlated with both the JBS and NFC. More educated participants tended to be defense biased and desire effortful thought during problem solving. Finally, gender was related to evidence evaluation. Female participants tended to evaluate information in favor of the defense.

Discussion

I began with the hypothesis that participants would distort information in the direction of the strong persuasive information they saw presented at the beginning of a sequence of evidence. I also hypothesized that participants would distort a diagnostic piece of evidence encountered at the end of the sequence in the direction of an initially encountered strong piece of evidence. Drawing on the Story Model of Juror Decision Making (Pennington & Hastie, 1992), Cognitive Consistency/Coherence (e.g., Holyoak & Simon, 1999; Simon, 2004; Thagard & Verbeurgt, 1998) and Predecisional Information Distortion (e.g., Carlson et al., 2006; Carlson & Russo, 2001; DeKay et al., 2009; DeKay et al., 2011; Meloy & Russo, 2004; Russo et al., 2006) literatures, I developed and ran an experiment to test these hypotheses. Participants were instructed to act as jurors and evaluated a sequence of mostly neutral evidence bookended by evidence that clearly favored the selection of guilty or not guilty, with or without knowing the source of the evidence. In support of my hypotheses, I observed that evidence was reliably distorted in the direction of the strong evidence presented first in the sequence and that diagnostic evidence at the end of the sequence was distorted towards the initially encountered strong evidence. When strong evidence supporting a verdict of guilty (favoring the prosecution) was presented in the first position, participants' distortion of the evidence trended towards the prosecution. When strong evidence supporting a verdict of not guilty (favoring the defense) was presented first, participants alternated their distortion between the prosecution and the defense.

While this distortion did not predict a final verdict, participants distorted evidence to support the evidence they first evaluated. Importantly, this occurred when evaluating neutral evidence as well as evidence that opposed the evidence participants first saw. That is,

participants evaluated an argument of equal and opposite strength to the first one encountered as being more aligned with the first presented evidence. This is of concern considering participants were instructed to evaluate information in an unbiased manner, and that the legal context implies rational decision making (Carlson & Russo, 2001; see also, Lawson, 1968; Simon, 2004).

Of further interest and a peculiar finding was the marginal effect that source information had on the direction of distortion. Participants who were not given information regarding which side (prosecution or defense) had presented the evidence in the trial tended to distort the evidence increasingly in favor of the prosecution. However, those who were given source information distorted all pieces of information in favor of the prosecution except the fourth piece encountered. It is important to note that for all conditions the fourth piece of evidence represents the half way point of the decision process. It was at this point that participants with source information were told that the next pieces of evidence would be presented by the opposing side (i.e., if they previously saw arguments said to be presented by the prosecution, evidence four was the first one said to come from the defense). It is intriguing that participants evaluated this piece of evidence on average as more favoring a verdict of not guilty (defense). The reason for this effect of source information on evidence evaluation is unclear.

Confidence was also observed to increase as the decision making progressed. On average, participants became increasingly more confident that their verdict leaning at each evidence evaluation would also be their final verdict. However, when evaluating the final piece of evidence (which favored the opposing verdict to the one first seen) participants' confidence was diminished. As the final piece of evidence opposed the initial evidence

presented, this decrease in confidence is not surprising and serves as an indication that participants were properly attending to the evidence and evaluation tasks. Interestingly, this decrease in confidence in the final position was not associated with decreased distortion as evidence in the final position was distorted the most strongly.

On average, confidence increased as the decision progressed; however, different patterns were observed depending on which piece of evidence was evaluated at the beginning of the series. Participants who saw evidence favoring a verdict of guilty (the prosecution) first tended to increase their confidence as they evaluated the final pieces of evidence. This was not true for those who saw evidence favoring a verdict of not guilty (the defense) first. For these participants, current verdict confidence tended to waver back and forth in a reasonably flat trend, not increasing or decreasing in a predictable way.

There was also a marginally significant effect of source information on current verdict confidence. Participants who were informed as to which side presented the evidence tended to be slightly more confident in their verdict leanings for all evidence pieces than those who saw no information regarding the source of the evidence. This relationship was not hypothesized but is a noteworthy finding. It is possible that considering the persuasive intent of each side in presenting the evidence resulted in participants bolstering their personal beliefs as a reaction to the persuasive nature of the prosecution or defense (Wood & Quinn, 2003). An alternate and possibly complementary explanation is that participants became more confident in their current verdict as they acquired more information, even without becoming more accurate, a finding previously observed by Tsai and colleagues (Tsai, Klayman, & Hastie, 2008). It may also be that when participants saw source information, this provided context for a story they created to make sense of the evidence (Pennington &

Hastie, 1992). This context may have led to participants evaluating evidence so that it formed a coherent argument for one verdict resulting in greater confidence (Holyoak & Simon, 1999; Simon, 2004). One or a combination of these explanations may account for this effect. These explanations, however, are speculation at this point as tests of these hypotheses are outside the scope of this experiment.

In this study, final verdict was not predicted by the experimental manipulation of the Strong Evidence Location. This contrasts with previous investigations into information distortion that were able to affect a final decision by placing strong information supporting a choice at the beginning of a series of attributes (Carlson et al., 2006; Russo et al., 2006). While my experimental manipulations did not achieve the same effect, the average of evidence evaluation and the absolute value of distortion predicted participants' final verdict. This indicates that participants who evaluated evidence to be supportive of a guilty or not guilty verdict rendered a final verdict consistent with that evaluation. Furthermore, those who distorted the evidence more heavily were also more likely to render a final verdict of guilty.

There are some important differences between the current study and previous research that should be considered in the context of present results. Previous studies used neutral pieces of information after the initial strong information so that distortion of the information could be easily observed (Carlson et al., 2006; Russo et al., 2006). While the current study used neutral evidence after the first strong piece of evidence, the evidence series was bookended by a piece of evidence that was approximately equal in strength and in opposition to the first piece of evidence. Also, and perhaps most importantly, the current study differs from those mentioned above in that the context of the legal system was used in

which participants were asked to render a verdict of guilty or not guilty. This is compared to contexts in which participants were asked to choose between brands of backpack (Carlson et al., 2006) or between restaurants (Carlson et al., 2006; Russo et al., 2006). The decision between brands of backpacks or between restaurants carries with it very little consequences other than perhaps a bit of buyer's remorse. On the other hand, rendering a verdict of guilty or not guilty is very important and carries with it additional risk of making a wrong decision. Considering this, it is possible that using leader-driven primacy to affect final choice is not powerful enough to result in participants making the corresponding verdict in a legal context. It is likely that participants were aware that the verdict of guilty and not guilty do not carry equal weights and do not have equal meanings (Gräns, 2010; Lawson, 1968; Simon, 2004). This awareness that the decisions are not equal and carry with them unequal risks (is it worse to set a guilty person free or imprison an innocent?) could be the culprit responsible for the low observed frequency of participants (26%) indicating guilty as their final verdict. This inequality in final verdict selections may also be the result of ambiguity reintroduced into the decision process when participants evaluated an opposing strong piece of evidence in the final position, just before rendering a final verdict. Encountering an opposing argument to the one they had previously seen (and were distorting information towards) may have changed a seemingly clear decision to an unclear one resulting in decreased confidence. A decrease in confidence may have been associated with rendering a not guilty verdict because less confident participants may have felt that since they were now less sure of their decision, a less risky choice of not guilty was preferable.

In an effort to understand better the characteristics among participants associated with this decision as well as other variables of interest, exploratory analyses were conducted

yielding some interesting results. The negative relationships between final verdict, Juror Bias Scale scores, average absolute value of distortion, and average current verdict confidence paint a picture in which a participant who evaluated the evidence in favor of the prosecution did so with more distortion, increased confidence, and tended to endorse prosecution biased statements. These individuals also were more likely to render a guilty verdict, tended to desire less effortful thought while problem solving, and be younger.

The findings of the experiment at present contribute to the legal and decision making literature by exhibiting that participants distorted information in the direction of the initially presented strong information when instructed to act as mock jurors. While information distortion has been observed in the legal context previously (Carlson & Russo, 2001), it had not been observed as the result of strong evidence in the beginning of the presentation series. By manipulating whether the first presented evidence favored the prosecution or defense, I was able to demonstrate that later information will be distorted in the direction of initially presented strong information. It is somewhat encouraging that this manipulation did not predict final verdict decisions. Participants may have felt they had no choice but to render a verdict of not guilty as the end result of the decision process may have installed a state of ambiguity (the average of all the pieces of evidence rated by the control group indicates favoring neither verdict). Faced with this ambiguity participants may have supplemented their evaluation of the evidence with their personal expectation of how the justice system is supposed to perform and their appraisal of the risk involved in the decision they were making. Considering that jurors' evaluations of evidence during trial are a function of both the evidence and the jurors themselves (Lawson, 1968), this explanation is plausible. Conversely, it is of concern that participants who distorted information more were also more confident in

their current verdicts and more likely to render a final verdict of guilty. Future studies could investigate this by examining the extent to which participants weighted evidence when rendering a verdict.

The findings of my study replicate those of cognitive consistency and coherence literature in which individuals become more confident in their emerging decision as the process develops (Gräns, 2010; Holyoak & Simon, 1999; Simon, 2004; Thagard & Verbeurgt, 1998). Participants were observed to become more confident as they evaluated more evidence and neared rendering their final verdict. The relationship between the absolute value of distortion and confidence further strengthens this replication. Distortion is conceptually a cognitive restructuring of information, and such distortion was observed to be associated with increases in confidence.

While this study was able to observe distortion in the direction of an installed leader within the legal context, it also had limitations that constrained information gleaned from it. The experiment was designed so that participants would experience evidence presented in exactly opposite orders, bookended by strong pieces of evidence. This design feature aided experimental control by keeping constant the order in which the evidence was evaluated, but in attempting to control for order effects, it may have inadvertently led to one. To judge properly the extent to which diagnostic information would be distorted, it was necessary to place the equally strong and opposite evidence where distortion was hypothesized to be the most strong: at the end of the sequence. Distortion was indeed observed to be largest for this point in the evaluation process despite the opposing diagnosticity of the evidence, but placing this diagnostic evidence directly before the final verdict decision may have affected the distribution of final verdicts by reducing participants' confidence.

Future research into this topic should focus on the factors intrinsic to an individual that are associated with the distortion of information. As increased distortion was associated with increased current verdict decision confidence and higher likelihood of rendering a final verdict of guilty, knowing the characteristics of a person that are associated with increased likelihood of distortion could have practical benefits. For example this information could be crucial in the juror selection process. A potential juror's tendency to distort may be hard to measure during the selection process, but currently unknown predictors of distortion may be easy to observe. Examples of these could include age, endorsements of prosecution biased statements, or indicators from other personality and individual difference measures not yet known to be associated with distortion. This information could inform the prosecution to select these kinds of individuals inclined to distort and the defense to move for their dismissal.

The extent to which participants distort information with both strong and persuasive information in the legal setting should also continue to be explored. While this study was able to demonstrate distortion in the direction of initially presented strong information, this distortion did not predict final verdicts. The decision of guilty or not guilty may be one that is not easily affected by the distortion process with the current configuration (i.e., case background, crime committed). It is certainly possible that in cases where a more severe crime is being considered, more diagnostic evidence is used, types of evidence (physical vs. circumstantial), or qualities of the defendant are manipulated so that verdict selection may be reliably and intentionally influenced.

The findings of my study have real-world implications in that the distortion of trial evidence by mock jurors was observed despite instruction and warning that jurors should

interpret the information without bias (see also, Carlson & Russo, 2001). This bias in general appears to favor the first seen piece of strong information, indicating a decision one way or another. Considering that the prosecution presents evidence first in criminal jury trials, this bias may currently affect the jury trial decision making process and increase the quality of the case the defense would need to counteract this effect. This presentation order and corresponding bias may not represent the same "innocent until proven guilty" philosophy that the American legal system is founded on.

In closing, this study expanded multiple decision making literatures (legal, coherence, information distortion) by observing that participants distorted their evaluations of evidence in a mock trial in the direction of an earlier piece of evidence that strongly favored the selection of one verdict over another. This distortion happened despite the presence (or absence) of information indicating the persuasive source of the evidence during the trial. This distortion was associated with increased decision confidence. Furthermore, the absolute value of distortion also predicted people's final verdict. Participants who distorted more were more likely to render a guilty verdict. Further investigation into the factors associated with the tendency to distort information during decisions and how individuals distort information with strong and persuasive components is warranted.

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Table 1.

Descriptive statistics and correlations between participant characteristics, evidence evaluation, evidence distortion, confidence, and final verdict.

	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. JBS (M=49.89, SD=8.24)	.31***	.07	.01	.12*	-.19**	-.26***	-.16**	-.31***	-.08
1. NFC (M=7.89, SD=15.41)	-	-.04	-.04	.13**	-.06	-.03	-.18**	-.08	.02
3. Age (M=40.43, SD=14.12)		-	.15*	.07	-.33***	.15*	-.06	-.16**	.10
4. Gender (47% Male, 53% Female)			-	-.08	-.18**	-.07	-.03	-.06	.08
5. Education (M=4.22, SD=1.38)				-	-.06	-.05	-.02	.02	-.10
6. Evidence Evaluation (M=5.07, SD= .84)					-	.33***	.19**	.45***	-.10
7. Absolute value of Evidence Distortion (M=1.06, SD=.58)						-	.38***	.40***	.27***
8. Confidence in current verdict (M=4.66, SD= 1.92)							-	.25***	.42***
9. Final verdict (74.3% Not Guilty, 25.7% Guilty)								-	.06
10. Final Confidence (M=5.88, SD= 2.07)									-

Note: JBS = Juror Bias Scale; NFC = Need for Cognition; Gender: 1 = Male, 2 = Female; Final verdict: 0 = Not guilty, 1 = Guilty; Education: 1= Some High School, 2=High School Equivalent, 3=Some College, 4= 2 Year College Degree, 5= 4 Year College Degree, 5= Masters Degree, 6= Professional/ Doctoral Degree.
* $p < .05$, ** $p < .01$, *** $p < .001$

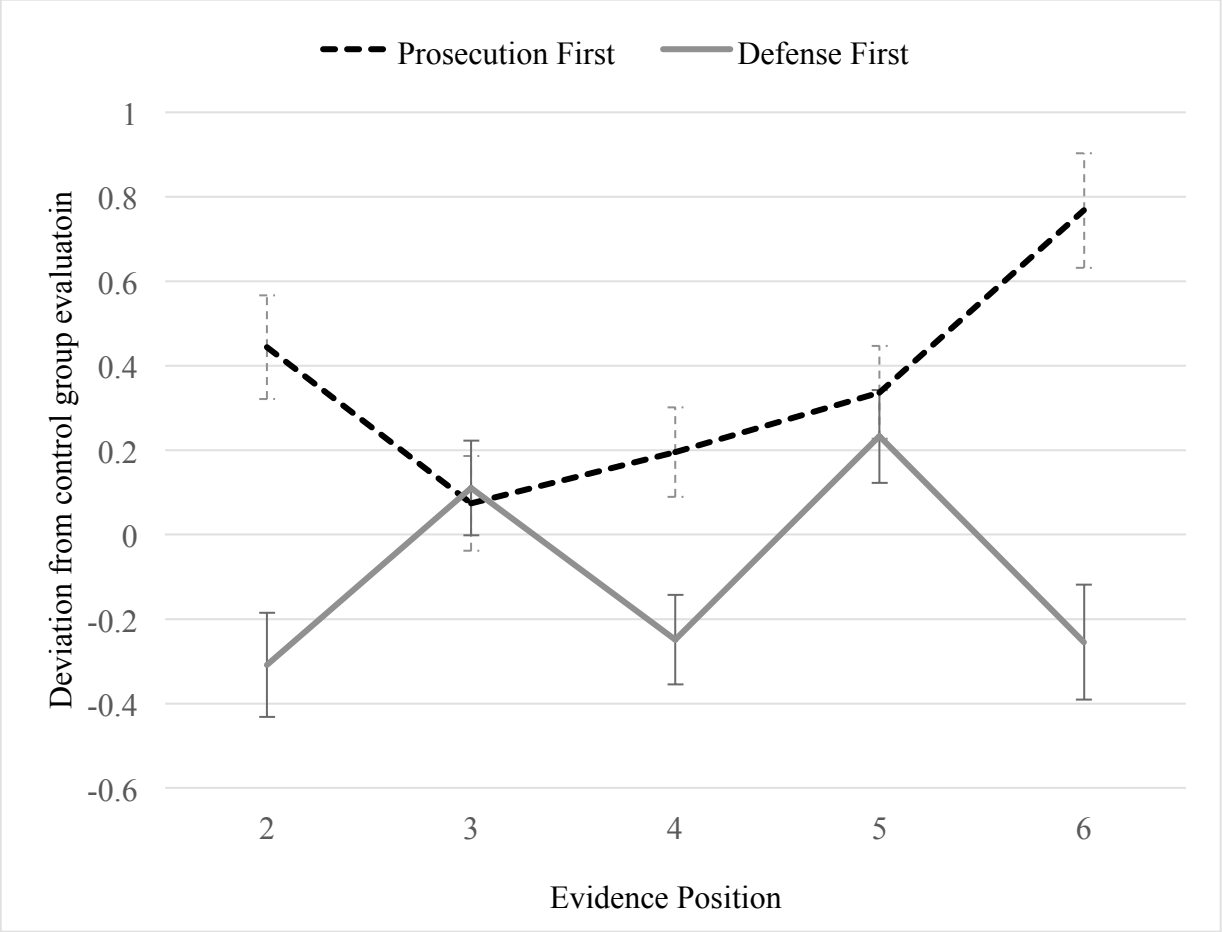


Figure 1. Participants' evaluation of pieces of evidence in terms of their deviation from control group values (distortion). Split according to which strong piece of evidence was seen at position one. Values above 0 indicate that the evidence was perceived to be more supportive of a guilty verdict while values below 0 indicate that the evidence was perceive to be more supportive of a not guilty verdict. Error bars represent ±1 standard error.

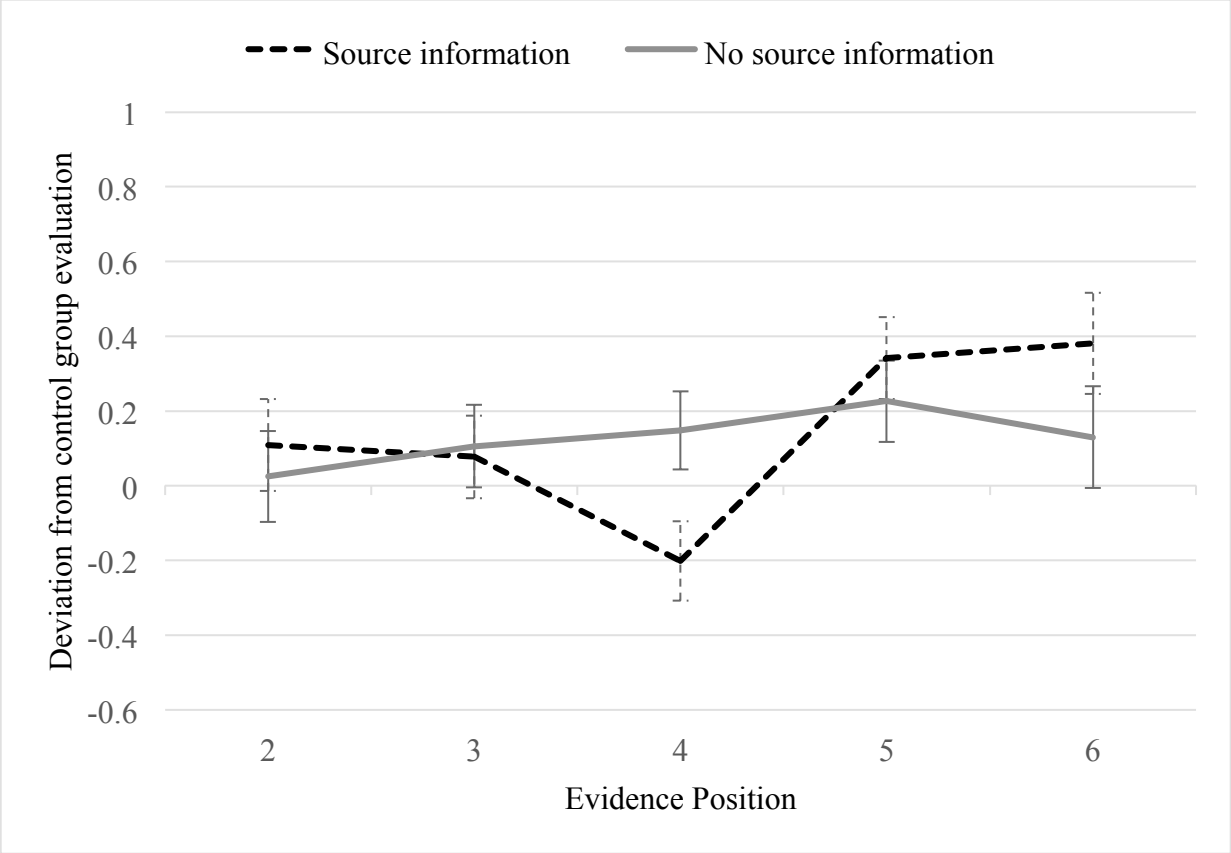


Figure 2. Participants' evaluation of pieces of evidence in terms of their deviation from control group values (distortion). Split according to which strong piece of evidence was seen at position one. Values above 0 indicate that the evidence was perceived to be more supportive of a verdict of guilty while values below 0 indicate that the evidence was perceive to be more supportive of a verdict of not guilty. Error bars represent ±1 standard error.

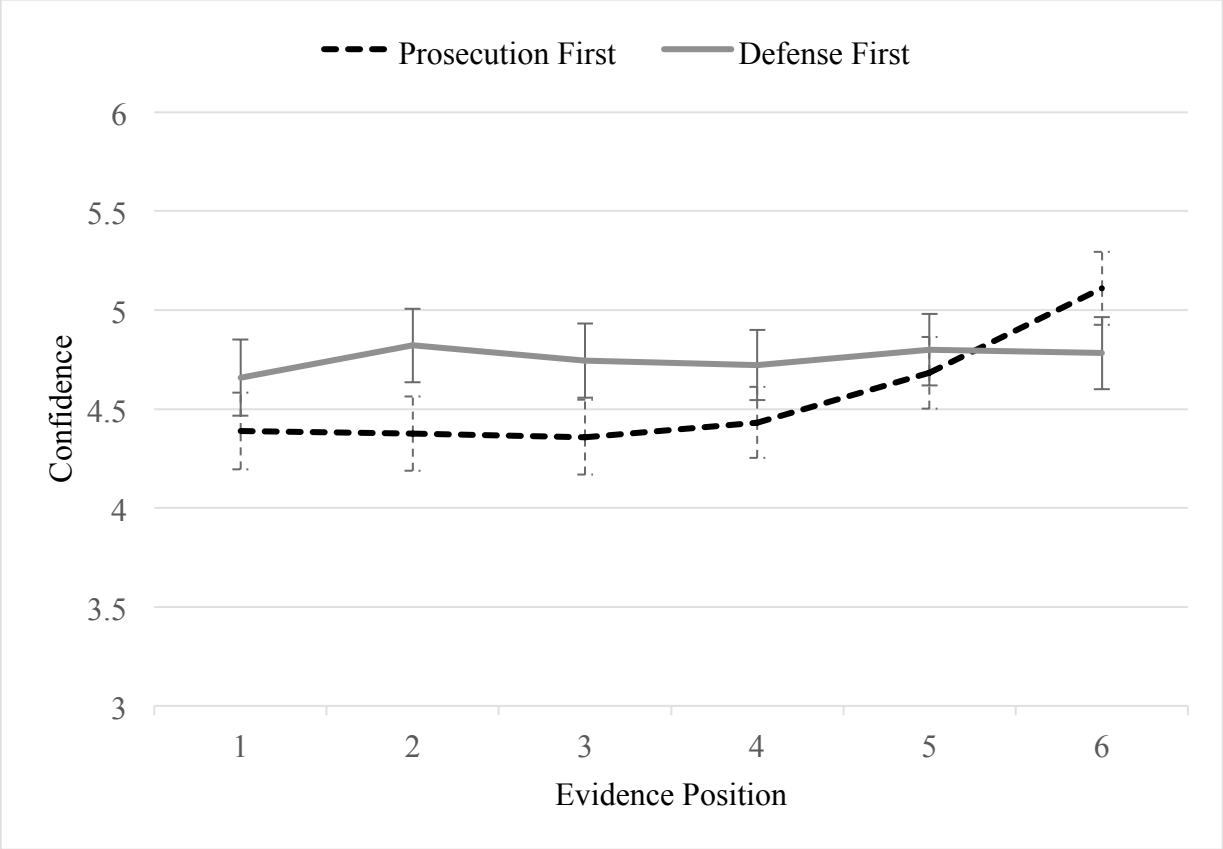


Figure 3. Confidence that participants' current verdict will also be their final verdict at each piece of evidence in the sequence on a 1-9 point scale, split according to which strong piece of evidence was seen at position one. Error bars represent ±1 standard error.

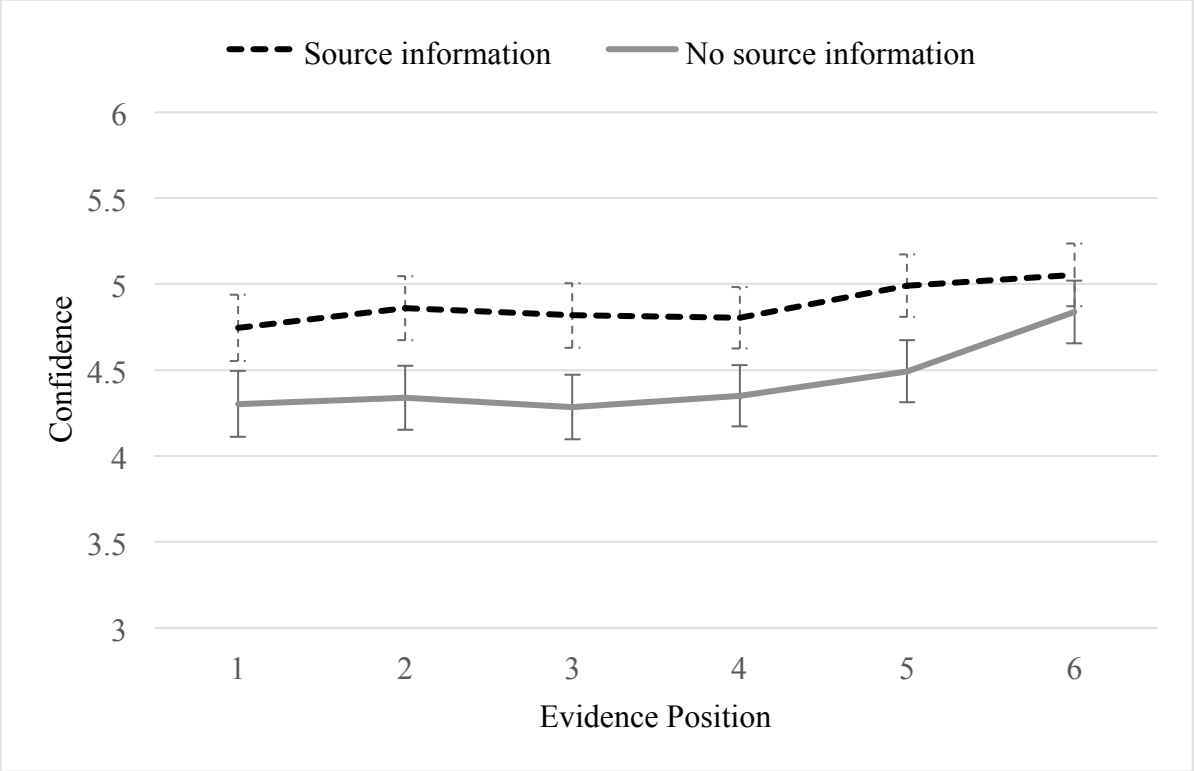


Figure 4. Confidence that participants' current verdict will also be their final verdict at each piece of evidence in the sequence on a 1-9 point scale, split by if the participants saw information regarding the source of the evidence in the trial. Error bars represent ±1 standard error.

Appendix A

To: Lindsay Marshall

CAMPUS MAIL

From: Dr. Stan Aeschleman, Institutional Review Board Chairperson
Date: 4/08/2013
RE: Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)
Study #: 13-0216

Study Title: Legal Decisions
Submission Type: Initial
Expedited Category: (7) Research on Group Characteristics or Behavior, or Surveys, Interviews, etc.
Approval Date: 4/08/2013
Expiration Date of Approval: 4/07/2014

This submission has been approved by the Institutional Review Board for the period indicated. It has been determined that the risk involved in this research is no more than minimal.

Investigator's Responsibilities:

Federal regulations require that all research be reviewed at least annually. It is the Principal Investigator's responsibility to request renewal of approval before the expiration date. You may not continue any research activity beyond the expiration date without IRB approval.

Any adverse event or unanticipated problem involving risks to subjects must be reported immediately to the IRB. You are required to obtain IRB approval for changes to any aspect of this study before they can be implemented except to eliminate apparent immediate hazards. Best wishes with your research!

CC:
Andrew Smith, Psychology

To: Lindsay Marshall

EMAIL

From: Dr. Stan Aeschleman, Institutional Review Board Chairperson
Date: 4/17/2014
RE: Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)
Study #: 13-0216

Study Title: Legal Decisions
Submission Type: Modification
Expedited Category: (7) Research on Group Characteristics or Behavior, or Surveys, Interviews, etc.
Approval Date: 4/17/2014
Expiration Date of Approval: 3/19/2015

The Institutional Review Board (IRB) approved the modification for this study. The IRB found that the research procedures meet the expedited category cited above. IRB approval is limited to the activities described in the IRB approved materials, and extends to the performance of the described activities in the sites identified in the IRB application. In accordance with this approval, IRB findings and approval conditions for the conduct of this research are listed below.

Submission Description:

No changes to study procedures or informed consent are made. In addition to collecting participants from the student sample participants will also be recruited using Amazon's Mechanical Turk (MTurk) in order to increase ease of recruitment and to gather information about a non-student sample. Informed consent will be delivered digitally with no changes other than format. MTurk is a site where potential participants can sign up for a variety of jobs—including participating in research. MTurk assigns each participants an ID number, so, as researchers, we do not have access to any identifying information. Furthermore, the online survey site will remain hosted by Qualtrics.com, so the participants MTurk ID number will not be associated with his/her survey responses. The participants will receive $.50 for participating in the online survey.

Regulatory and other findings:

The IRB determined that this study involves minimal risk to participants.

The IRB waived the requirement to obtain a signed consent form for some or all subjects because the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context.

Approval Conditions:

Appalachian State University Policies: All individuals engaged in research with human

participants are responsible for compliance with the University policies and procedures, and IRB determinations.

Principal Investigator Responsibilities: The PI should review the IRB's list of PI responsibilities. The Principal Investigator (PI), or Faculty Advisor if the PI is a student, is ultimately responsible for ensuring the protection of research participants; conducting sound ethical research that complies with federal regulations, University policy and procedures; and maintaining study records.

Modifications and Addendums: IRB approval must be sought and obtained for any proposed modification or addendum (e.g., a change in procedure, personnel, study location, study instruments) to the IRB approved protocol, and informed consent form before changes may be implemented, unless changes are necessary to eliminate apparent immediate hazards to participants. Changes to eliminate apparent immediate hazards must be reported promptly to the IRB.

Approval Expiration and Continuing Review: The PI is responsible for requesting continuing review in a timely manner and receiving continuing approval for the duration of the research with human participants. Lapses in approval should be avoided to protect the welfare of enrolled participants. If approval expires, all research activities with human participants must cease.

Prompt Reporting of Events: Unanticipated Problems involving risks to participants or others; serious or continuing noncompliance with IRB requirements and determinations; and suspension or termination of IRB approval by external entity, must be promptly reported to the IRB.

Closing a study: When research procedures with human subjects are completed, please complete the Request for Closure of IRB review form and send it to irb@appstate.edu.

Websites:

1. PI responsibilities: http://researchprotections.appstate.edu/sites/researchprotections.appstate.edu/files/PI%20Responsibilities.pdf

2. IRB forms: http://researchprotections.appstate.edu/human-subjects/irb-forms

CC:
Andrew Smith, Psychology

Appendix B

Diagnosticity of Evidence from the Control Condition

Number	Type	Evidence	Mean	SD
1	Strongly favors defense	A receipt as well as a bank statement showed that Mr. S was eating lunch in a restaurant at the time the money was removed from the account via his office computer.	2.87	1.50
2	Neutral	Mr. S aided in the prosecution of a former employee of the company whom had been accused of stealing in a similar manner.	4.57	1.62
3	Neutral	There is little oversight as to Mr. S's activities concerning movement of finances and payment of material providers.	5.03	1.64
4	Neutral	Around the time the money went missing from the company, Mr. S had been staying to work late.	5.58	1.03
5	Neutral	Mr. S has been in the bank where the company has its professional accounts numerous times around when the money went missing.	5.92	1.50
6	Strongly favors prosecution	The account from which the funds were withdrawn was created via Mr. S's password protected computer in his company office.	6.93	0.90

Note: The top three pieces of evidence were said to come from the defense while the bottom three were said to come from the prosecution. Evidence evaluation scores were obtained from the control condition (n = 106) where participants evaluated the evidence on a 1(strongly favors a verdict of not guilty) to 9 (strongly favors a verdict of guilty) scale.

Appendix C

Consent to Participate in Research: *Information to Consider About this Research*

Legal Decisions

Principal Investigator: Lindsay D. Marshall, 222 Joyce Lawrence Ln. Boone, NC 28608. (859)-230-4165. Marshallld1@appstate.edu.
Faculty Supervisor: Andrew R. Smith Ph.D smithar3@appstate.edu.
Questions regarding the protection of human subjects may be addressed to the IRB Administrator, Research and Sponsored Programs, Appalachian State University, Boone, NC 28608 (828) 262-2130, irb@appstate.edu

You are being invited to take part in a research study about the ways in which people make decisions in a legal setting. By doing this study we hope to learn about the psychological mechanisms involved in decisions made in legal contexts. You will be asked to read some short statements on the computer and then answer a few questions about each followed by a few questions about yourself.

You cannot volunteer for this study if you are under 18 years of age as you must be at least 18 to participate in legal proceedings and the study is designed to assess psychological mechanisms of the population eligible to participate in the legal system.

This procedure is anticipated to take roughly 25-30 minutes.

What are the possible benefits and risks of the research?
There may be no personal benefit from your participation but the information from this research may help others in the future to understand the ways in which decisions are made in certain contexts and could help society as a whole to better understand information processing in humans.

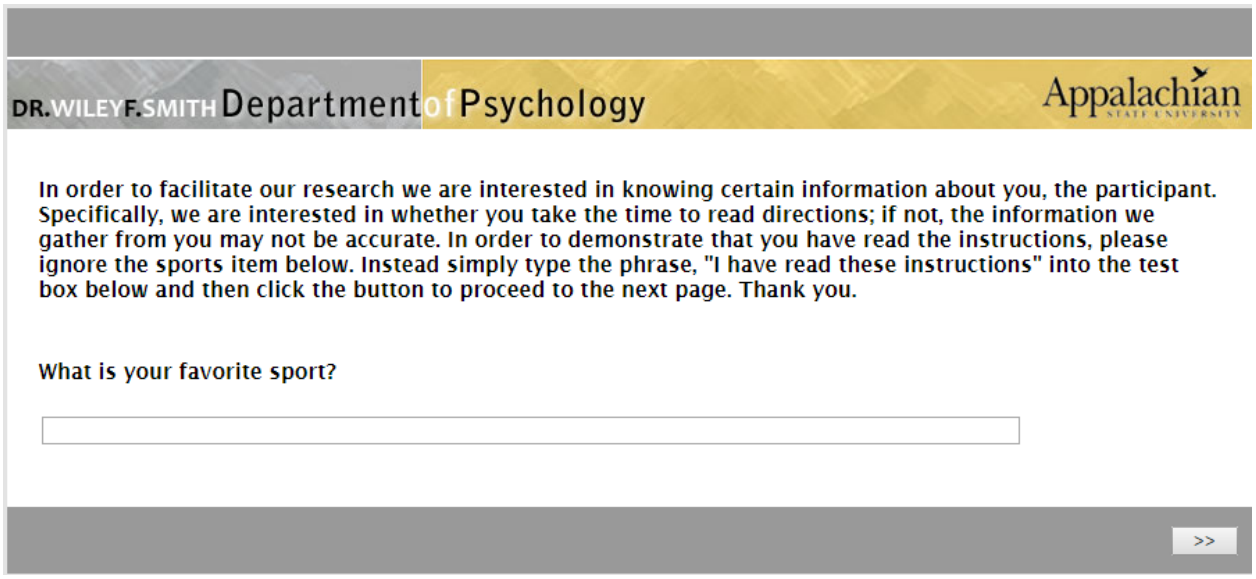
To the best of our knowledge, the risk of harm for participation in this research study is no more than you would experience in everyday life.

This study is anonymous. That means that no one, not even members of the research team, will know that the information you gave came from you.

Who can I contact if I have questions?
The people conducting this study will be available to answer any questions concerning this research, now or in the future. You may contact the Principal Investigator at
Lindsay Marshall
(859)-230-4165
marshallld1@appstate.edu
Do I have to participate? What else should I know?
Your participation in this research is **completely voluntary**. There will be no consequences if you choose not to volunteer or decide to stop participating at any time.
By continuing this study, I acknowledge that I am at least 18 years old, have read the above information, and provide my consent to participate under the terms above.
This research project has been approved on 4/8/2013 by the Institutional Review Board (IRB) at Appalachian State University. This approval will expire on 4/7/2014 unless the IRB renews the approval of this research.

Appendix D

Attention Check Item



Appendix E

Instructions:

In this study you will be shown pieces of information from a legal case and you will be asked questions about the information you see. The legal case involves a man named Mr. S. who has been accused of a crime. Your job is to act as a juror in this case, analyze each argument for or against Mr. S., and ultimately come to a final verdict. You are to evaluate the information and decide if you think Mr. S. is guilty or innocent of a crime. Please carefully read all the information and answer all the questions as accurately and honestly as possible.

The following instructions are given to jurors in actual trials. You should follow these instructions during this study.

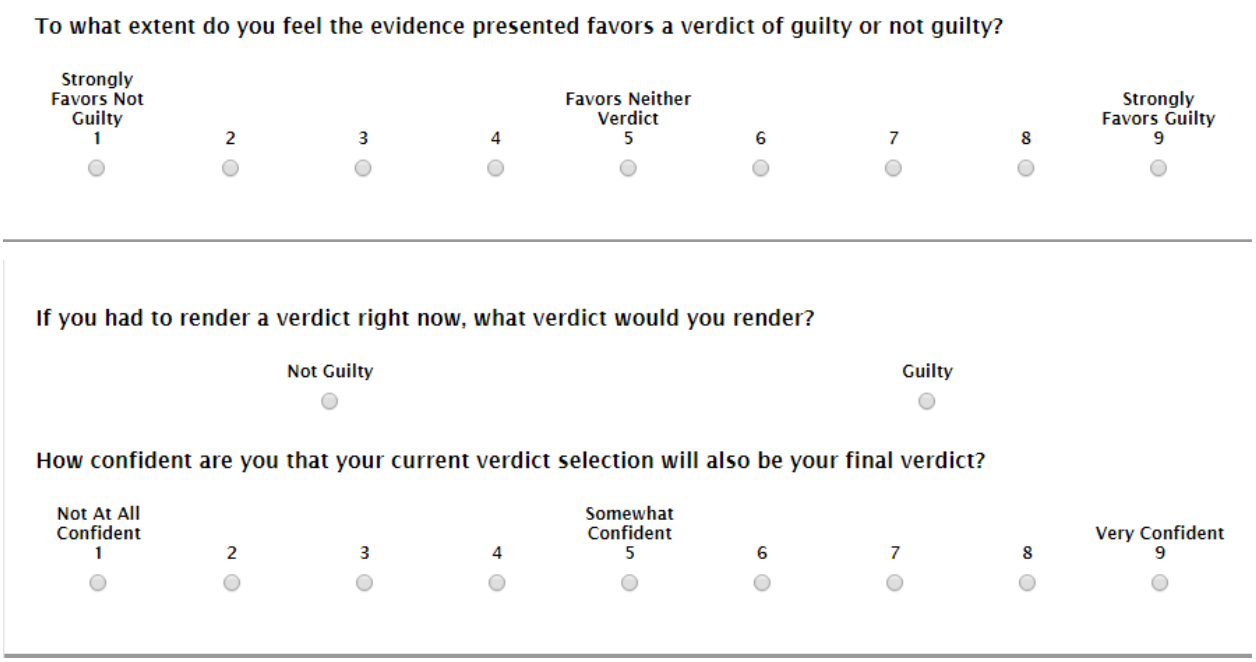
Keep an open mind throughout the trial. Do not make up your mind about the verdict or any issue until after you have evaluated all of the evidence. Do not let bias, sympathy, or prejudice influence your decision. You must reach your verdict without any consideration of punishment**.**

Case Background:

Mr. S. is the Materials Acquisition and Distribution Manager for Company WCQ that manufactures various components for use in computers and other electronics. His job entails managing the finances required to purchase and organizing the delivery of raw materials necessary to complete the components at multiple manufacturing locations. He has been with the company for 15 years. He has been accused of theft in the amount of $20,000 from the company. On the following pages you will see pieces of evidence presented by the prosecution or defense during the case against Mr. S.

Appendix F

Questions that follow the presentation of each piece of evidence.



Vita

Lindsay Davis Marshall was born in Lexington, Kentucky, the son of David R. Marshall and Erin Brynn Gallaher. He graduated from Lafayette Senior High School in 2006 and began undergraduate study first at Bluegrass Community and Technical College and then the College of Charleston. He received his Bachelor of Science in Psychology in May 2011. In the fall of 2012, he began study towards a Master of Arts degree in General Experimental Psychology at Appalachian State University. He also began study on a Master of Business Administration concentrating in Business Analytics in the winter of 2014. He received both degrees in May 2015.